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FLOOD INSURANCE STUDY

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CITY OF ARKADELPHIA, ARKANSAS
CLARK COUNTY

OCTOBER 15, 1980

federal emergency management agency
federal insurance administration

COMMUNITY NUMBER - 050029

FEMA 28

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
	1.1 Purpose of Study	1
	1.2 Authority and Acknowledgments	1
	1.3 Coordination	1
2.0	AREA STUDIED	2
	2.1 Scope of Study	2
	2.2 Community Description	2
	2.3 Principal Flood Problems	4
	2.4 Flood Protection Measures	7
3.0	ENGINEERING METHODS	7
	3.1 Hydrologic Analyses	7
	3.2 Hydraulic Analyses	9
4.0	FLOOD PLAIN MANAGEMENT APPLICATIONS	10
	4.1 Flood Boundaries	10
	4.2 Floodways	11
5.0	INSURANCE APPLICATION	15
	5.1 Reach Determinations	15
	5.2 Flood Hazard Factors	16
	5.3 Flood Insurance Zones	16
	5.4 Flood Insurance Rate Map Description	17

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TABLE OF CONTENTS - continued

		Page
6.0	OTHER STUDIES	17
7.0	LOCATION OF DATA	17
8.0	BIBLIOGRAPHY AND REFERENCES	19

FIGURES

Figure 1 -	Vicinity Map	3
Figure 2 -	1968 Flood scene at Missouri - Pacific Railroad Crossing over the Ouachita River	5
Figure 3 -	Recreational and housing area in Arkadelphia during the 1968 flood	5
Figure 4 -	1968 Flood at the Ouachita Marine Industrial Corporation	6
Figure 5 -	1968 Flood scene at the Arkadelphia Airport	6
Figure 6 -	Floodway Schematic	15

TABLES

Table 1 -	Summary of Discharges	8
Table 2 -	Floodway Data	12-14
Table 3 -	Flood Insurance Zone Data	18

EXHIBITS

Exhibit 1 - Flood Profiles

Ouachita River	Panel 01P
Mill Creek	Panels 02P-03P
Maddox Branch	Panels 04P-05P

Exhibit 2 -Flood Boundary and Floodway Map

PUBLISHED SEPARATELY:

Flood Insurance Rate Map

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in City of Arkadelphia, Clark County, Arkansas, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study will be used to convert the City of Arkadelphia to the regular program of flood insurance by the Federal Insurance Administration (FIA). Local and regional planners will use this study in their efforts to promote sound flood plain management.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than those on which these Federally-supported studies are based. These criteria take precedence over the minimum Federal criteria for purposes of regulating development in the flood plain, as set forth in the Code of Federal Regulations at 24 CFR, 1910.1 (d). In such cases, however, it shall be understood that the state (or other jurisdictional agency) shall be able to explain these requirements and criteria.

1.2 Authority and Acknowledgments

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were performed by Garver & Garver, Inc., for the Federal Insurance Administration, under Contract No. H-4746. This study was completed in December 1979.

1.3 Coordination

Flooding within Arkadelphia and the selection of streams for the study were discussed at a meeting on May 3, 1978, attended by local citizens and officials of the City of Arkadelphia, representatives of Garver & Garver, Inc., and personnel of the Dallas Regional Office of the FIA.

On April 15, 1980, the results of the study by Garver & Garver, Inc., were reviewed at a final coordination meeting attended by personnel from Garver & Garver, Inc., the FIA, and community officials.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the entire incorporated area of the City of Arkadelphia, Clark County, Arkansas. The area of study is shown on the Vicinity Map (Figure 1).

Floods caused by the overflow of the Ouachita River, Maddox Branch, and Mill Creek were studied in detail. These areas were selected with priority given to all known flood hazard areas, and areas of projected development of proposed construction for the next five years, through December 1984.

The flood hazard data presented in this report reflect the current conditions. No future flood control projects nor any increases in runoff due to future urbanization were included in the analyses.

2.2 Community Description

The City of Arkadelphia, Arkansas, is located on the west bank of the Ouachita River in northeast Clark County, approximately 420 river miles above the mouth of the Black River and 75 miles southwest of Little Rock at a point where the foothills of the Ouachita Mountains meet the coastal plain. Fifty miles to the north are bauxite mines and to the south lie the oil and gas fields of southern Arkansas. The entire area within a 75 mile radius of Arkadelphia constitutes one of the greatest timber growing regions of the United States. The city is served by Interstate Highway 30, State Highways 7,8, and 51, U.S. Highway 67, and the Missouri Pacific Railroad.

The economy of Arkadelphia is based primarily on industry, the largest industries being Reynolds Metals, and Levi Strauss and Company. A large amount of income is derived from the surrounding forests and forest products. Soybeans and livestocks are the main agricultural products.

Arkadelphia is one of the oldest cities in Arkansas. The first white settlement at the site was Barkman's Landing, established in 1807, but the area had always been a favored camping ground of the Ouachita and Caddo Indian tribes. The city was known as Hemphill Settlement from 1811 until sometime before 1825, named after John Hemphill who established a salt manufacturing operation, the city's first industry. The city's name was changed to Blakeleytown prior to 1825 , and remained such until 1842, when the county seat, which had been moved 4 times in the previous 17 years, was permanently established there. About 1838, the local citizens adopt the name "Arcadelphia" for the city. Blakeleytown officially became "Arkadelphia" in 1842. The city was incorporated on January 6, 1857. A special Census in 1975 showed 10,227 people in Arkadelphia, an increase of 386 over the 1970 Census (Reference 1).

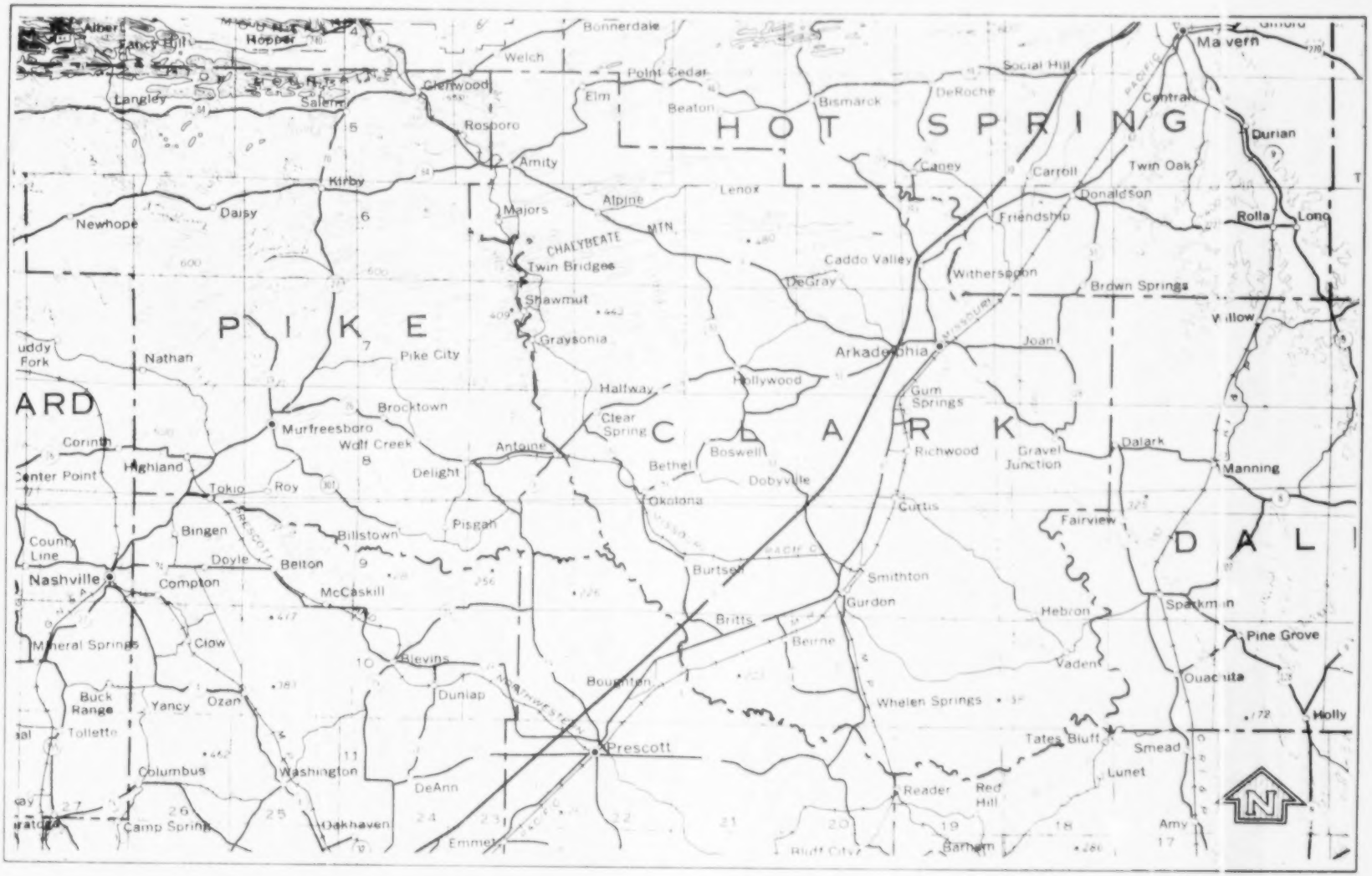


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

CITY OF ARKADELPHIA, AR

(CLARK CO.)

APPROXIMATE SCALE

8 0 8 16 24 MILES

VICINITY MAP

Arkadelphia is a college town, home of Ouachita Baptist University and Henderson State University. Ouachita Baptist was founded in 1885, and Henderson State in 1890, as Henderson-Brown College, a Methodist institution. Henderson-Brown was taken over by the State in 1929, as Henderson State Teachers College, achieving University standing in the 1970's.

Arkadelphia has an average annual temperature of 63 degrees F. Temperatures range from near 11 degrees F in the winter to about 99 degrees F in the summer. Arkadelphia has an average annual precipitation of 52.5 inches (Reference 2).

Soil in the study area are of two general types. Approximately 90 percent of Arkadelphia is deep, moderatley permeable, well drained, acid, loamy soils on gently sloping hilltops. The very eastern edge of Arkadelphia contains deep, moderately slowly and slowly permeable, well and poorly drained, acid, loamy soils on bottom lands. Most of this area surrounding the Ouachita River is subject to flooding.

Mill Creek and Maddox Branch have drainage areas greater than one square mile. Both creeks originate in the western part of the city and drain eastward toward the Ouachita River. The creeks drain rolling terrain with elevations ranging from 400 ft. above National Geodetic Vertical Datum of 1929 (NGVD) on the west side of Arkadelphia to 170 ft. NGVD at the Ouachita River. The Ouachita River flows southeasterly into Louisiana where it empties into the Red River.

There have been several severe floods in Arkadelphia such as the ones that occurred in 1927, 1938, 1939, and 1968 (Figures 2 through 5). The greatest known flood to have occurred on the Ouachita River occurred in March 1945, with a stage of 30.3 feet on the Corps of Engineers' (COE) gage at the State Highway 7 Bridge.

2.3 Principal Flood Problems

Inadequate channel maintenance on Mill Creek and Maddox Branch is the primary contributing factor to poor drainage. Six road crossing structures on Mill Creek and five similar structures on Maddox Branch create obstructions to flood flow. Also, urban development and the subsequent removal of natural vegetation has caused a more rapid runoff into the streams.

The most significant areas of flooding in the urban area occur as a result of overflow from the Ouachita River. This flooding occurs in north Arkadelphia along U.S. Highway 67 and along the Mill Creek Channel to 15th Street; and in southeast Arkadelphia along Maddox Branch and the Missouri Pacific Railroad.

FIGURE 2: 1968 flood scene at the Missouri Pacific Railroad Crossing over the Ouachita River.

FIGURE 3: Recreational and housing area in Arkadelphia during the 1968 flood.

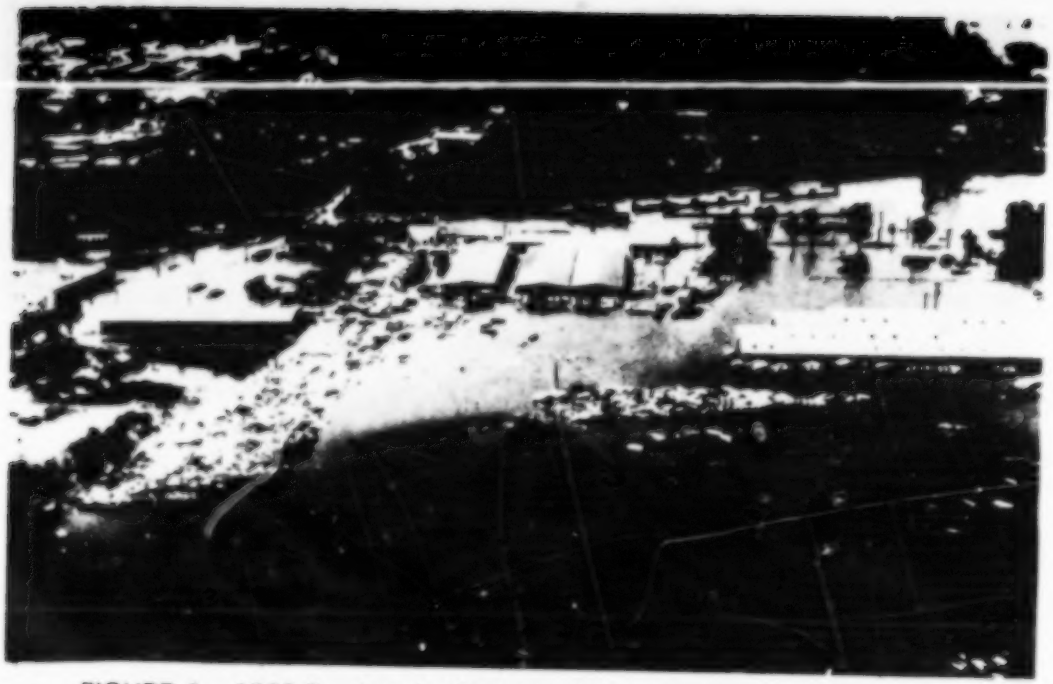


FIGURE 4: 1968 flood at the Ouachita Marine Industrial Corporation.

FIGURE 5: 1968 flood scene at the Arkadelphia Airport.

2.4 Flood Protection Measures

Flood flows on the Ouachita River are regulated by Blakely Mountain Dam, which began storage in Lake Ouachita in July 1952; and DeGray Dam completed in 1971 on the Caddo River, a major tributary of the Ouachita River upstream from Arkadelphia. These two dams control the runoff from about 67 percent of the watershed. Two other privately owned power dams on the Ouachita River have little or no effect on flood flow.

Channel cleaning and straightening performed along Mill Creek upstream of 15th Street in conjuction with subdivision development has improved flood flow in this area.

No significant flood protection measures have been undertaken along Maddox Branch.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equalled or exceeded once on the average during any 10-, 50-, 100-, and 500-year period (recurrence intervals), have been selected as having special significance for flood plain management and for flood insurance premium rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equalled or exceeded during any year. Although the recurrence interval represents the long term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than one year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (one percent chance of annual occurrence) in any 50 year period is about 40 percent (four in 10), and for any 90 year period, the risk increases to about 60 percent (six in 10). The analyses reported here reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for floods of the selected recurrence intervals for each flooding source studied in detail in the community.

Synthetic storms were computed to define the discharge-frequency data for Mill Creek and Maddox Branch. Rainfall distribution for the 10-, 50-

and 100-year frequencies were computed from rainfall-frequency data contained in the National Weather Service Technical Paper No. 40 (Reference 3). Snyder's coefficients were used to compute unit hydrographs for the streams. The hydrographs and rainfall distributions were used to compute synthetic storms of the desired frequencies, from which the peak discharges were obtained. A Log-Probability relationship of the lower frequency peak discharges were used to compute each of the 500-year peak discharges.

The peak flows along the study reach of Mill Creek are reduced by the storage upstream of Interstate Highway 30 which is caused by restrictions at the culvert under Interstate Highway 30. Peak flows along the lower portion of Maddox Branch are reduced by the backwater storage above the Missouri Pacific Railroad and the losses which occur when drainage leaves the basin and travels west along U.S. Highway 67 during flood stage.

Gage data for the Ouachita River was provided by the Vicksburg District, COE. Rating Curves and Stage-Frequency Curves were drawn to obtain the peak flows for the Ouachita River.

The peak discharge-drainage area relationships for the selected recurrence intervals are presented in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
OUACHITA RIVER					
State Highway 51	2,311	66,000	115,000	140,000	200,000
MILL CREEK					
Mouth	4.00	2,508	3,261	3,618	4,155
12th Street	3.41	2,563	3,300	3,642	4,330
Interstate Highway 30	1.20	1,585	2,006	2,185	2,591
MADDOX BRANCH					
Missouri Pacific Railroad	1.35	860	920	940	980
West 12th Street	0.95	1,260	1,603	1,766	2,215

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of the flooding sources studied in detail in the City of Arkadelphia were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along each of the flood sources.

Below water sections of channels, bridges, and culverts were surveyed to obtain elevation data and structural geometry. Additional topographic information and overbank elevations on cross sections were provided by aerial surveys. Cross sections were located at close intervals upstream and downstream of bridges and culverts in order to compute significant backwater effects of these structures.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1).

For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are shown on the Flood Boundary and Floodway Map (Exhibit 2).

Channel roughness factors (Manning's "n") used in the hydraulic computations, were chosen by engineering judgement and based on field observations of the streams and flood plain areas. Roughness values for the main channel of the Ouachita River range from 0.03 to 0.045 with flood plain roughness values ranging from 0.08 to 0.12 for all floods. Roughness values for the main channel of Mill Creek range from 0.035 to 0.055 with flood plain roughness values ranging from 0.08 to 0.11. Maddox Branch has main channel roughness values ranging from 0.04 to 0.08 with flood plain roughness values ranging from 0.09 to 0.12.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals.

Water-surface profiles were computed through use of the COE HEC-2 step-backwater computer program (Reference 4). Starting water-surface elevations for Mill Creek and Maddox Branch were determined by computing rating curves for the channel cross sections nearest the mouth of each Creek. Starting water-surface elevations were picked from these curves for the 10-, 50, 100-, and 500-year peak flows.

The initial starting water-surface elevations for the Ouachita River were picked from the river profiles found in the FPIR. These elevations were lowered slightly to reflect the head losses caused by the State Highway 51 and Missouri Pacific Railroad bridges. The final flood profiles for the Ouachita River generally varied by less than one foot from the flood profiles previously published in the FPIR, and were found to be in agreement with the Ouachita River gage at the State Highway 51 bridge.

All elevations used in this study are referenced to National Geodetic Vertical Datum of 1929, formerly referred to as Sea Level Datum of 1929; elevation reference marks used in this study are shown and described on the maps.

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operated properly, and do not fail.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages state and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the FIA as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the boundaries of the 100- and the 500-year floods have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24,000 with a contour interval of 10 feet (Reference 5). In cases where the 100- and the 500-year flood boundaries are close together, only the 100-year boundary has been shown.

The boundaries of the 100- and 500-year floods are shown on the Flood Boundary and Floodway Map (Exhibit 2). Small areas within the flood boundaries may lie above the flood elevations and, therefore, not be subject to flooding; owing to limitations of the map scale, such areas are not shown.

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity, increases the flood heights of streams, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent flood plain areas that must be kept free of encroachment in order that the 100-year flood may be carried without substantial increases in flood heights. Minimum standards of the FIA limit such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this report are presented to local agencies as minimum standards that can be adopted or that can be used as a basis for additional studies.

The floodway presented in this study was computed on the basis of equal conveyance reduction from each side of the flood plain. The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway was computed (Table 2).

As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway widths were determined at cross sections; between cross sections, widths were interpolated and boundaries drawn. In cases where the floodway and the 100-year boundaries are close together, only the floodway boundary has been shown.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 6.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Ouachita River								
A	420.5	1476/216[2]	18,769	7.5	188.6	188.6	189.5	0.9
B	420.6	1500/184[2]	17,945	7.8	188.9	188.9	189.4	0.5
C	421.0	3000/184[2]	40,158	3.5	192.0	192.0	192.6	0.6
D	422.0	7000/44[2]	90,292	1.6	194.0	194.0	195.0	1.0
E*	424.7	8,000	81,703	1.7	197.9	197.9	198.7	0.8

[1]Miles above mouth
[2]Total floodway width/width within corporate limits
*Outside corporate limits; Not shown on map

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

CITY OF ARKADELPHIA, AR
(CLARK CO.)

FLOODWAY DATA

OUACHITA RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F P S)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Mill Creek								
A	1,550	150	748	4.8	192.3	178.9[2]	179.8	0.9
B	3,510	100	375	9.6	192.3	184.1[2]	184.1	0.0
C	3,890	250	1,374	2.6	192.3	185.5[2]	186.4	0.9
D	4,530	66	457	7.9	192.3	187.6[2]	188.2	0.6
E	5,110	70	423	8.6	192.3	190.6[2]	190.6	0.0
F	5,690	75	457	8.0	192.9	192.9	193.6	0.7
G	7,290	75	461	7.9	200.5	200.5	201.5	1.0
H	7,430	75	575	6.3	204.0	204.0	204.0	0.0
I	9,330	75	412	5.3	211.4	211.4	211.9	0.5
J	12,020	75	321	6.8	228.7	228.7	229.6	0.9
K	12,450	75	467	4.7	230.3	203.3	231.1	0.8
L	14,900	42	265	8.2	247.5	247.5	248.4	0.9

[1]Feet above mouth
[2]Water-surface elevations determined without considering backwater effects

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

CITY OF ARKADELPHIA, AR

(CLARK CO.)

FLOODWAY DATA

MILL CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Maddox Branch								
A*	10,350	225	192	4.9	189.4	189.4	189.4	0.0
B	10,975	225	828	2.1	191.3	191.3	192.0	0.7
C	11,210	225	775	2.3	191.9	191.9	192.9	1.0
D	11,370	181	931	1.9	193.1	193.1	193.4	0.3
E	11,620	200	470	3.8	193.1	193.1	193.8	0.7
F	12,250	200	535	3.3	195.8	195.8	196.8	1.0
G	12,430	200	626	2.8	197.5	197.5	197.6	0.1
H	13,030	71	230	7.7	199.6	199.6	200.0	0.4
I	13,320	30	168	10.5	201.9	201.9	202.4	0.5

[1] Feet above mouth
*Outside corporate limits

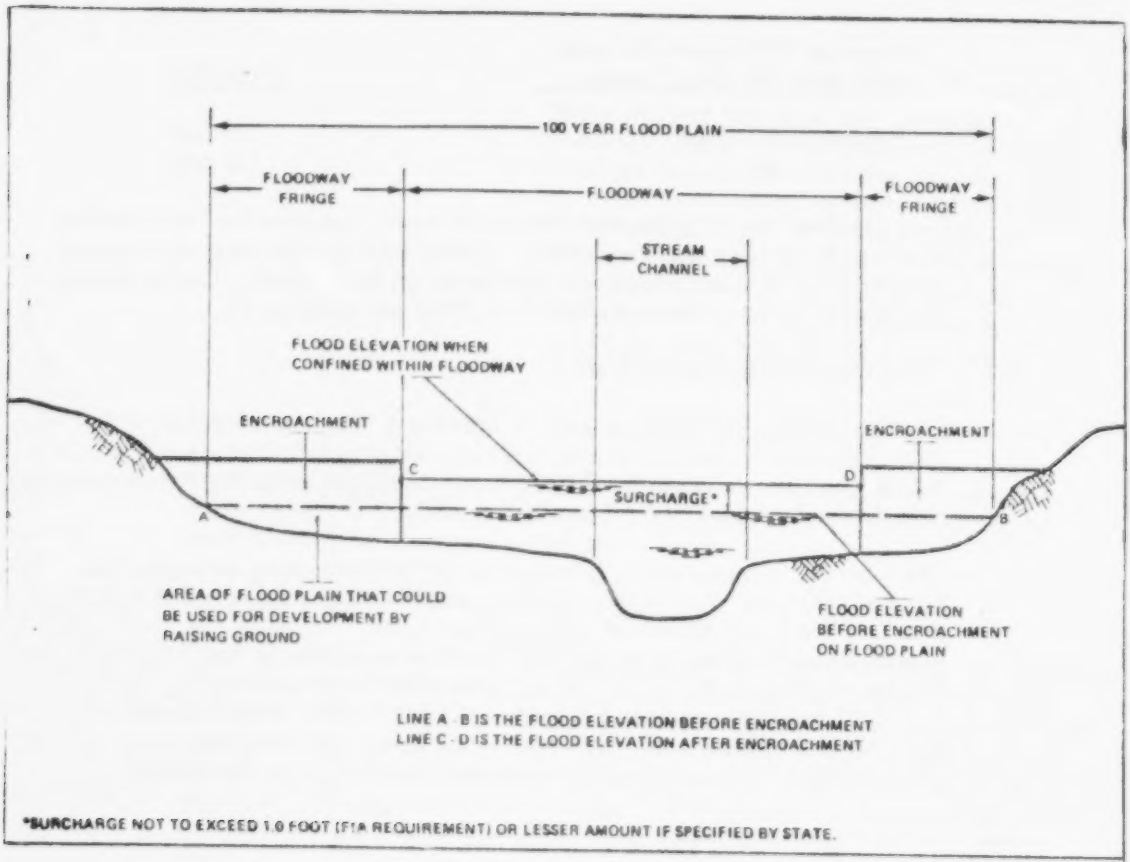
TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

CITY OF ARKADELPHIA, AR
(CLARK CO.)

FLOODWAY DATA

MADDOX BRANCH


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A - B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C - D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FIA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

FLOODWAY SCHEMATIC

Figure 6

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the FIA has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors (FHFs), and flood insurance zone designations for each significant flooding source affecting the City of Arkadelphia.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach.

Average Difference Between 10- and 100-Year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot

Five reaches meeting the above criteria were required for the flooding sources of the City of Arkadelphia. These include one each on Maddox Branch and the Ouachita River, and three on Mill Creek. The locations of the reaches are shown on the Flood Profiels (Exhibit 1).

5.2 Flood Hazard Factors (FHFs)

The Flood Hazard Factor is used to correlate flood information with insurance rate tables. Correlations between property damages from floods and their assigned FHFs are used to set actuarial insurance premium rate tables based on FHFs from 005 to 200.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest one-half foot, and shown as a three-digit code. For example, if the difference between the water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year flood water-surface elevations is greater than 10.0 feet, the accuracy for the FHF is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective FHFs, the entire incorporated area of the City of Arkadelphia was divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations.

Zones A1, A2, A3, & A9: Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations shown, and zones subdivided according to FHFs.

Zone B:	Areas between the Special Flood Hazard Area and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; or areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.
Zone C:	Areas of minimal flooding.

Table 3, "Flood Insurance Zone Data," summarizes the flood elevation differences, FHFs, flood insurance zones, and base flood elevation for each flooding source studied in detail in the community.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the City of Arkadelphia is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the FIA.

6.0 OTHER STUDIES

In February 1969 a Flood Plain Information Report for Arkadelphia, Arkansas, was published by the Vicksburg District of the COE (Reference 6). The report contains technical information on past and potential floods along the Ouachita River. The results of this study were in general agreement with the water-surface profiles and flood outlines published in the Flood Plain Information Report.

In 1974, a Flood Hazard Boundary Map for the City of Arkadelphia, Arkansas, was published by the FIA (Reference 7). This map was used to help determine the streams to be analyzed in this study.

7.0 LOCATION OF DATA

Survey, hydrologic, hydraulic, and other pertinent data used in this study can be obtained by contacting the Insurance and Mitigation Division, Federal Emergency Management Agency, Federal Center, Denton, Texas 76201.

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FHF	ZONE	BASE FLOOD ELEVATION[3]
		10% (10 YR.)	2% (50 YR.)	0.2% (500 YR.)			
Ouachita River							
Reach 1	0005	-4.72	-1.49	+3.08	045	A9	Varies
Mill Creek							
Reach 1	0005	-0.81	-0.24	+0.55	010	A2	Varies
Reach 2	0005	-1.45	-0.47	+0.97	015	A3	Varies
Reach 3	0005	-0.71	-0.18	+0.43	005	A1	Varies
Maddox Branch							
Reach 1	0005	-0.48	-0.15	+0.40	005	A1	Varies

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE
[3]ROUNDED TO NEAREST FOOT-SEE MAP

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

CITY OF ARKADELPHIA, AR

(CLARK CO.)

FLOOD INSURANCE ZONE DATA

OUACHITA RIVER-MILL CREEK-MADDOX BRANCH

8.0 BIBLIOGRAPHY AND REFERENCES

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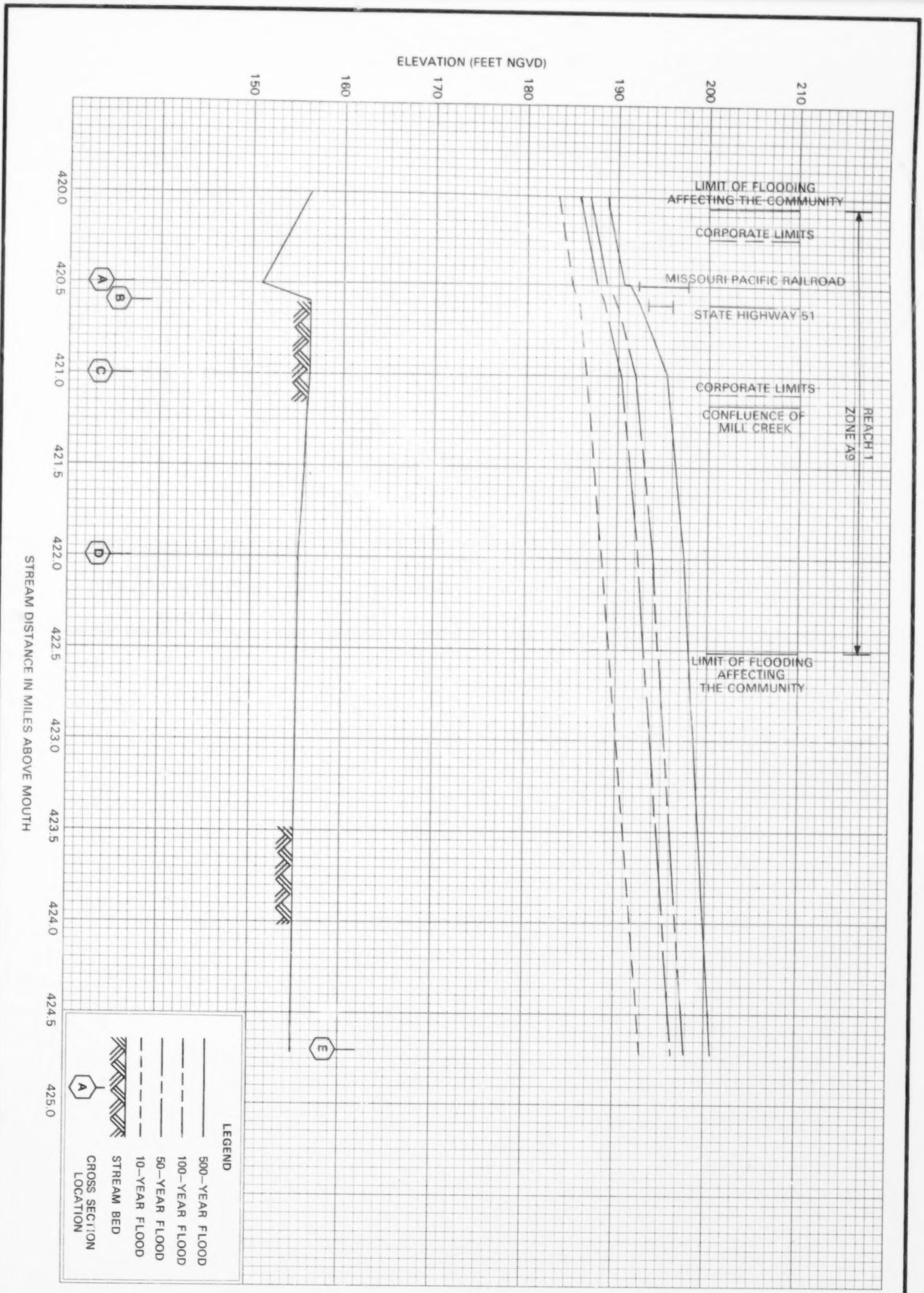
7. Flood Hazard Boundary Map, City of Arkadelphia, Arkansas, 1974; Department of Housing and Urban Development, Federal Insurance Administration, Washington, D.C.



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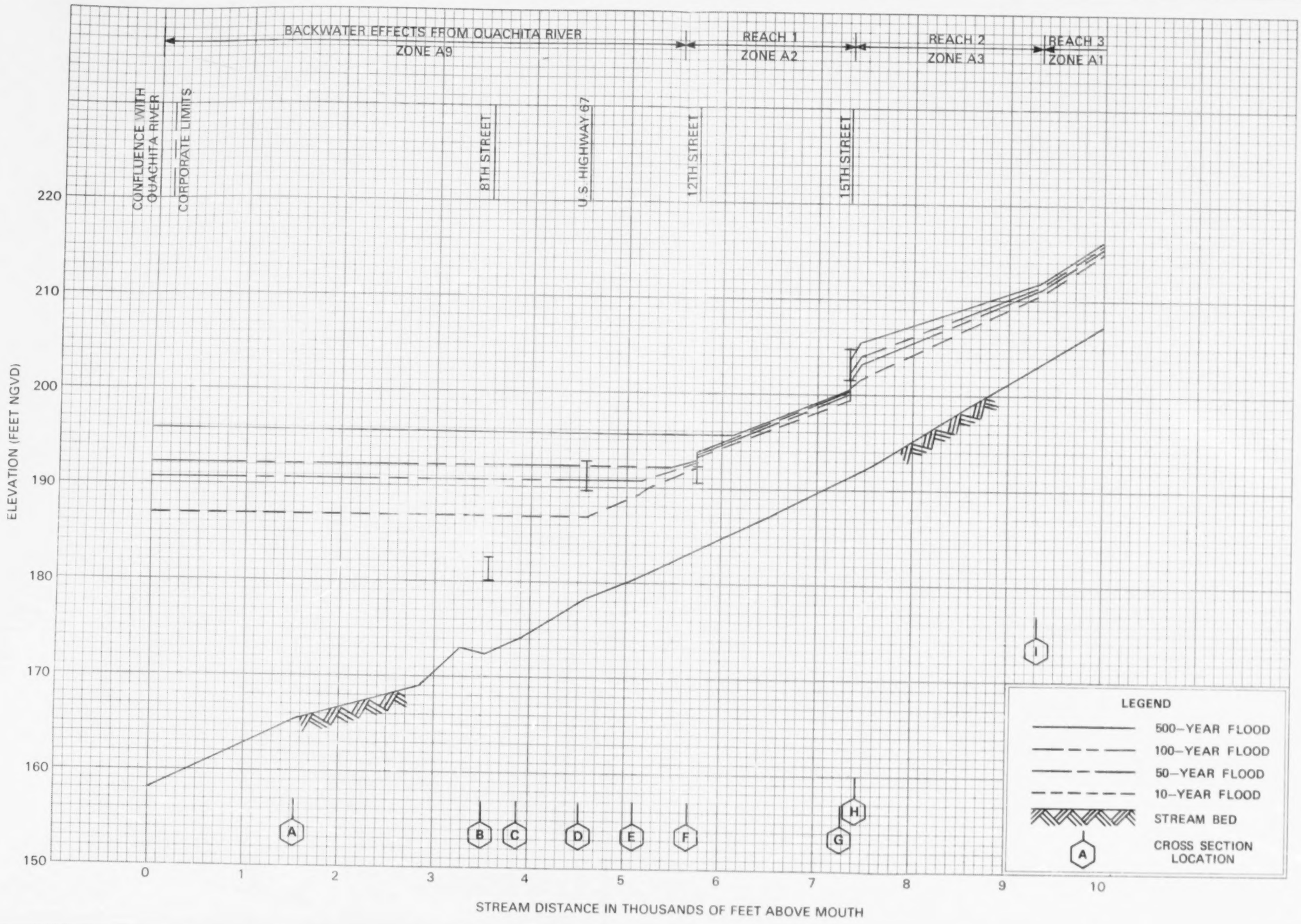

FLOOD PROFILES

MILL CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
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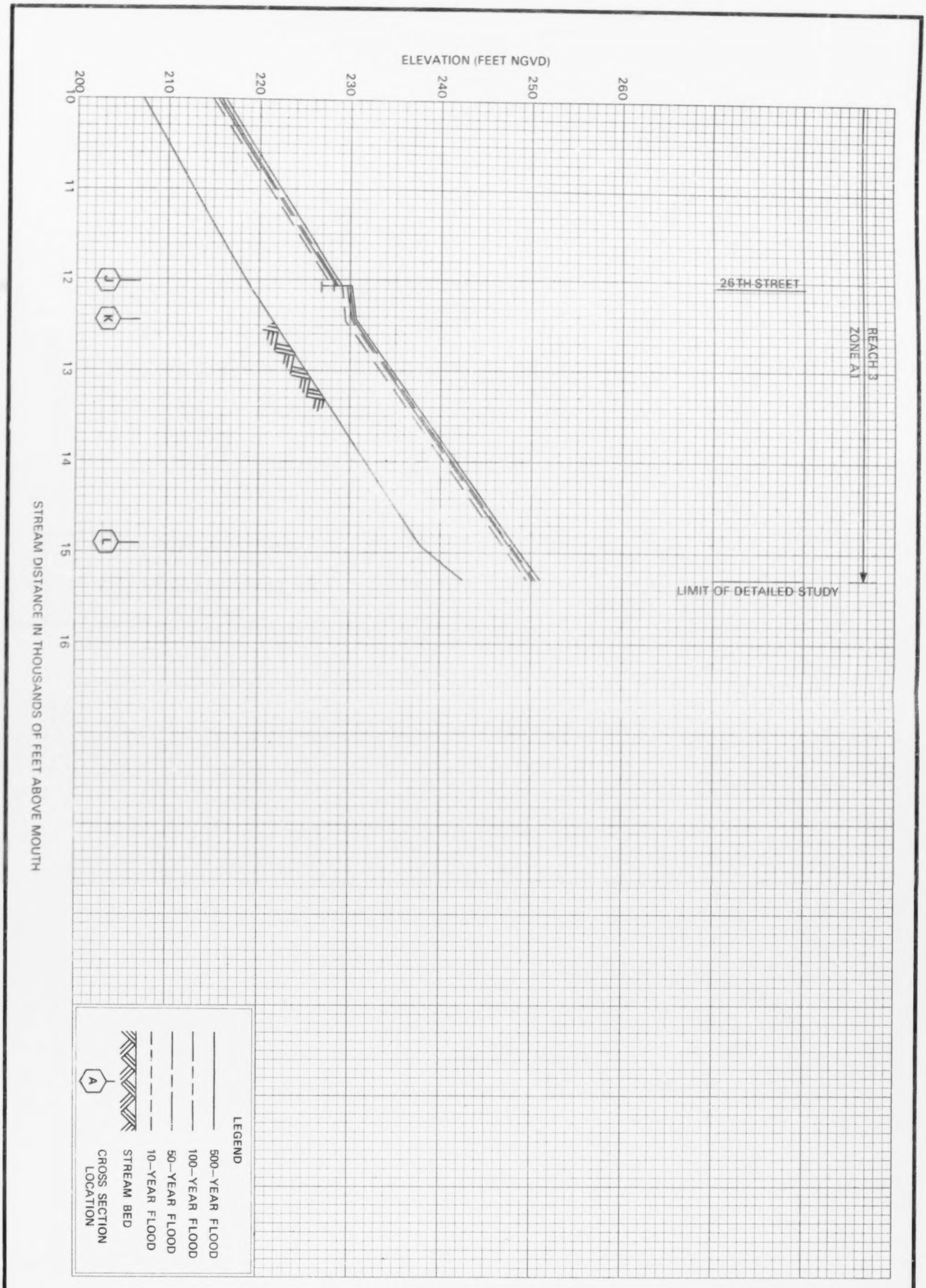

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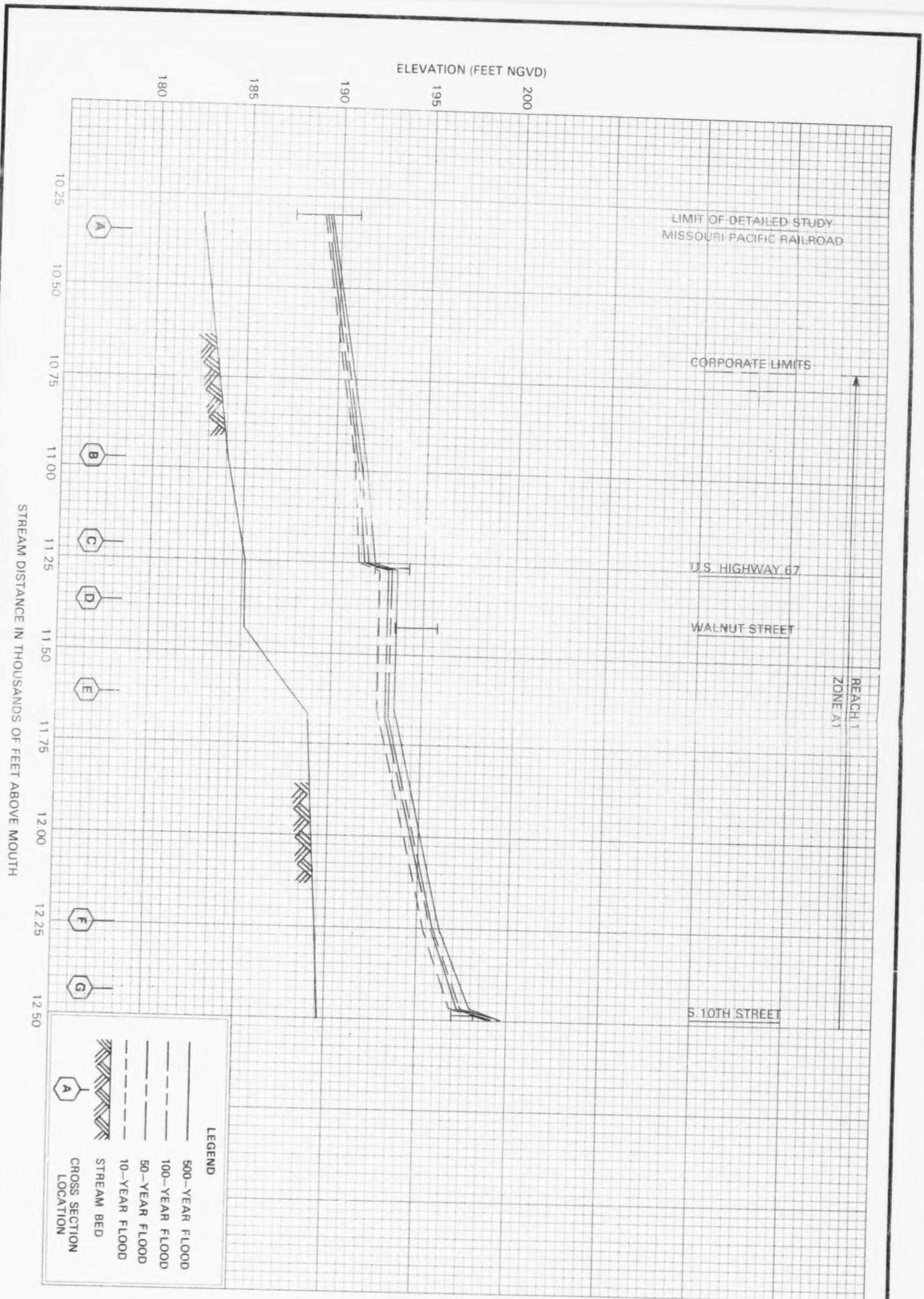
FLOOD PROFILES

MILL CREEK



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CITY OF ARKADELPHIA, AR
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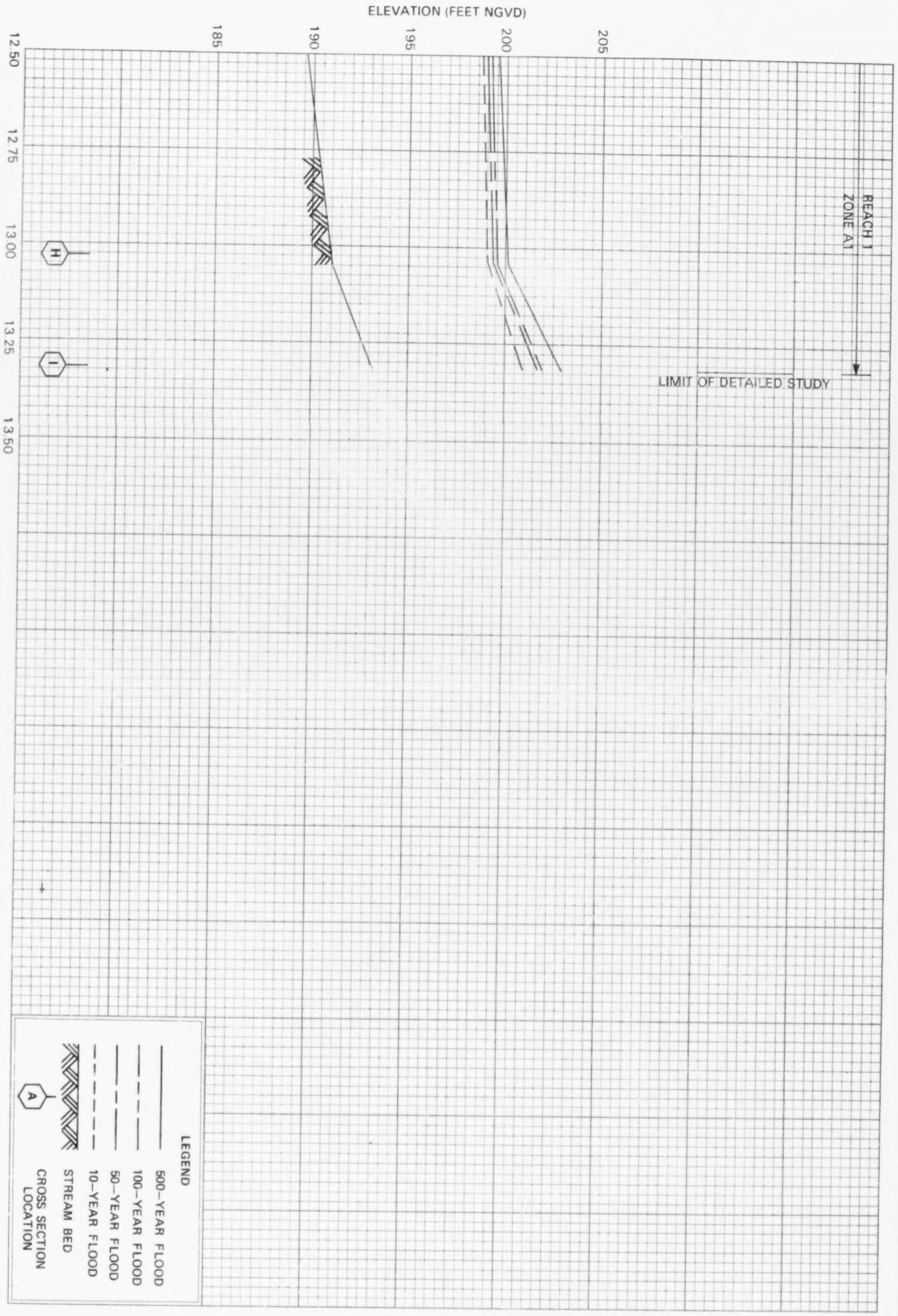
FLOOD PROFILES

MADDOX BRANCH



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FLOOD PROFILES

MADDOX BRANCH